

# Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US04/041434

International filing date: 08 December 2004 (08.12.2004)

Document type: Certified copy of priority document

Document details: Country/Office: US  
Number: 60/527,898  
Filing date: 08 December 2003 (08.12.2003)

Date of receipt at the International Bureau: 24 January 2005 (24.01.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland  
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

*January 10, 2005*

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 60/527,898

FILING DATE: *December 08, 2003*

RELATED PCT APPLICATION NUMBER: *PCT/US04/41434*



Certified By

Jon W Dudas

Under Secretary  
of Commerce for Intellectual Property  
and Acting Director of the  
United States Patent and Trademark Office

15866 U.S. PTO  
120803

SUBSTITUTE PTO/SB/16 (5-03)

**PROVISIONAL APPLICATION FOR PATENT COVER SHEET**

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR §1.53(c).

INVENTOR(S)					
Given Name (first and middle [if any])		Family Name or Surname		Residence (City and either State or Foreign Country)	
Jim Tony		Cree Milliken		Richmond, Virginia Terre Haute, Indiana	
Additional inventors are being named on the <u>0</u> separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
Dual Energy Laminate					
CORRESPONDENCE ADDRESS					
Direct all correspondence to:					
<input checked="" type="checkbox"/> Customer Number: 26231					
OR					
<input checked="" type="checkbox"/> Firm or Individual Name		Fish & Richardson P.C.			
Address		5000 Bank One Center			
Address		1717 Main Street			
City		Dallas	State	Texas	ZIP 75201
Country		United States	Telephone	214-747-5070	Fax 214-747-2091
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification		Number of Pages	10	<input type="checkbox"/> CD(s), Number	
<input checked="" type="checkbox"/> Drawing(s)		Number of Sheets	2	<input type="checkbox"/> Other (specify)	
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76.					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input type="checkbox"/> Applicant Claims small entity status. See 37 CFR 1.27.				FILING FEE	
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees.				AMOUNT (\$)	
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:				06-1050	\$160.00
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are:					

Respectfully submitted,

Signature Keith E. Taber

Date December 8, 2003

Typed Name Keith E. Taber, Reg. No. 46,114

Telephone No. (214) 292-4035

Docket No. 15838-345001

90060287.doc

**CERTIFICATE OF MAILING BY EXPRESS MAIL**

Express Mail Label No. EL979831903US

Date of Deposit December 8, 2003

PROVISIONAL APPLICATION FOR PATENT

under

37 CFR §1.53(c)

TITLE: Dual Energy Laminate

APPLICANT: Jim Cree  
Tony Milliken

CERTIFICATE OF MAILING BY EXPRESS MAIL

Express Mail Label No. EL979831903US

December 8, 2003  
Date of Deposit

## DUAL ENERGY LAMINATE

### **TECHNICAL FIELD**

This invention relates to absorbent articles, and more particularly to laminate materials for use as topsheets and intermediate layers of absorbent articles.

### **BACKGROUND**

5 In an absorbent article it is desirable to have fluids absorbed quickly, fluids maintained within the article, and an article which feels soft to the user.

### **DESCRIPTION OF DRAWINGS**

FIG. 1 is a micrograph of a nonwoven material laminated to a formed film.

FIG 2 is a micrograph of the material of FIG 1 after activation to expose portions of the  
10 formed film.

Like reference symbols in the various drawings indicate like elements.

### **DETAILED DESCRIPTION**

Absorbent articles 10 typically comprise three basic elements: topsheet 12, backsheet 14, and absorbent core 16. Recent improvements to this basic design have included the use of  
15 intermediate layer 18. Intermediate layer 18 may be anywhere between the basic elements, but typically is positioned between the topsheet 12 and the absorbent core 16.

Dual energy laminate 20 may be used as a topsheet 12 or as an intermediate layer 18. Dual energy laminate 20 is comprised of a nonwoven layer 22 combined with an apertured film layer 24. The nonwoven layer 22 and apertured film layer 24 may be laminated. One lamination  
20 technique is vacuum formed lamination, where the film layer 24 is a vacuum formed film and the nonwoven layer 22 is formed on the surface of the film layer 24 either during the vacuum forming or soon thereafter, such that the nonwoven layer 22 is thermally bonded to the film layer 24.

Nonwoven layer 22 may be comprised of any nonwoven material that is hydrophobic.  
25 The performance of the final product will be improved if the nonwoven layer is extensible, either because of the material of the fibers or the type of bond between the fiber. In other words, if the fibers are extensible, or if there is sufficient fiber to fiber bond slippage for the nonwoven layer

22 to be extensible. The extensible nature of the nonwoven is preferred to avoid tears, so that a non-extensible material may be used where tears are desired, or where the material will not tear for other reasons.

Apertured film layer 24 may be comprised of any thermoplastic film that is either  
5 hydrophilic or may be treated to be hydrophilic. Most thermoplastic films would be hydrophobic without treatment. Treatments to make hydrophobic films hydrophilic include the use of resin incorporated surfactants, corona treatment of the film, and treatment with applied surfactants. These, and other treatments, may be used alone or in combination.

Dual energy laminate 20 is formed by allowing the formed film layer 24 to be exposed  
10 through the nonwoven layer 22. The exposure may be caused in the formation of the nonwoven or by activation of the laminate after formation. Activation refers to any process for localized stretching such as the use of intermeshing gears or interdigitating members. The film layer 24 does not need to be completely exposed through the nonwoven layer 22. As an example, FIG 1 shows a composite of nonwoven layer 22 and formed film layer 24 from the nonwoven side of  
15 the composite. The formed film layer 24 is not exposed. FIG 2 shows the same material after activation and the film layer 24 exposed.

The dual energy laminate 20 may be made by using VFL laminating followed by IMG activation. "Vacuum Formed Lamination" is a process used by Tredegar to create laminates of formed film and nonwovens. The resin for the formed film is extruded onto a vacuum forming  
20 drum. A vacuum is applied to the drum sucking portions of the film through holes in the drum surface, or screen, so that apertures are formed in the film. At the same time, or soon after, a nonwoven web of fibers is deposited on the film being formed, or recently formed. Because the film is still warm and the fibers are somewhat molten that materials bond, but do not blend. In other words, the nonwoven is formed on top of the formed film.

25 The laminate is then run through a machine of intermeshing gears, known as IMG activation. The IMG activation provides localized stretching to create the disturbances in the nonwoven layer where the formed film is exposed. Other methods may also be used.

The following data refers to an exemplary embodiment that was activated using intermeshing gears. The phrase "25 Penta" refers to the formed film layer of this embodiment, a  
30 formed film available from Tredegar Corp. by the trade name "25 Penta". The data is for the laminate:

PHYSICAL PROPERTY	UNITS	25 Penta Dual Energy
LOFT (low load thickness)	microns	446
BASIS WEIGHT	gsm	32
REWET (saline-70)	grams	0.07
STRIKETHROUGH (saline-70)	seconds	5.0
REWET (SB-P)	grams	0.49
STRIKETHROUGH (SB-P)	seconds	14.7
MD PEAK TENSILE	lb/in	2.37
MD ELONGATION @ PEAK TENSILE	%	67
TD PEAK TENSILE	lb/in	1.08
TD ELONGATION @ PEAK TENSILE	%	73

The following data shows that the improvements in strike through (“Strikethru”) of the dual energy laminate can be achieved with a wide variety of base films. The base films represented below are “25 Penta”, “Elipse”, and “40 Hex”, all available from Tredegar Corp.

	Strikethru Saline	Rewet Saline	Strikethru Pepto	Rewet Pepto
	Seconds	Grams	Seconds	Grams
25 Penta VFL	14.7	0.06	37.7	0.43
25 Penta Dual Energy	5.0	0.07	14.71	0.49
Elipse VFL	63.8	0.06	41.6	0.68
Elipse Dual Energy	5.0	0.06	12.89	0.58
40 Hex VFL	34.9	0.11	68.0	0.40
40 Hex Dual Energy	5.70	0.05	21.09	0.45

An advantage of the dual energy laminate is that the texture is softer than a typical nonwoven or film. The panel data below shows that the dual energy versions of several samples are far softer than the regular versions.

	Lam #1	Lam #2	Lam #3	Lam #4				
	Dual	Dual	Dual	Dual				
Panelist	Energy	Energy	Energy	Energy	Lam #1	Lam #2	Lam #3	Lam #4
1	3	5	2	1	4	7	6	8
2	5	1	4	3	6	2	7	8
3	4	3	2	1	6	8	7	5
4	2	8	4	1	3	7	6	5
5	2	3	4	1	6	5	8	7
6	3	5	6	1	2	8	4	7
7	3	1	5	4	6	2	8	7
8	2	4	3	1	6	8	7	5
9	1	4	2	3	6	5	7	8
avg.	2.8	3.8	3.6	1.8	5.0	5.8	6.7	6.7

The strikethrough data below was collected using actual feminine pads in the testing.

Both thin and thick pads were tested with dual energy laminates and standard laminates as shown below.

5

**STRIKETHROUGH DATA:**

	Sample 1 (sec)	Sample 2 (sec)	Sample 3 (sec)	Average (sec)	Std Dev
Thick Pad Dual Energy	10.36	10.36	10.13	<b>10.3</b>	0.13
Thick Pad	12.14	9.1	14.58	<b>11.9</b>	2.75
Thin Pad Dual Energy	8.71	10.8	8.12	<b>9.2</b>	1.41
Thin Pad	8.12	10.46	14.31	<b>11.0</b>	3.13

A number of embodiments of the invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Accordingly, other embodiments are within the scope of the following claims.

10



**WHAT IS CLAIMED IS:**

- 1 1. A material for use in an absorbent article having a topsheet, and absorbent core, and a  
2 backsheet, the material comprising:  
3 a substantially hydrophobic nonwoven layer; and  
4 a substantially hydrophilic film layer boded with the nonwoven layer such that areas of  
5 the film layer are exposed through the nonwoven layer.
- 6 2. A material for use in an absorbent article having a body facing side and a garment facing  
7 side, the material comprising:  
8 a substantially hydrophobic nonwoven layer; and  
9 a substantially hydrophilic film layer on the garment facing side of the nonwoven layer;  
10 the nonwoven layer having areas where the film layer is exposed to the body facing side  
11 of the nonwoven layer.
- 12 3. The material of claims 1 or 2 wherein the formed film layer and the nonwoven layer form  
13 a laminate.
- 14 4. The materials of claims 1 or 2 wherein the formed film layer and the nonwoven layer  
15 form an activated laminate.
- 16 5. A method for forming a material for use in an absorbent article, the method comprising:  
17 introducing a first molten thermoplastic material to a vacuum forming drum;  
18 exerting a vacuum on the vacuum forming drum to form a film;  
19 introducing molten fibers of a second thermoplastic material onto the film during , or  
20 soon after formation of the film to create a laminate; and  
21 introducing the laminate to an activation process to create localized disturbances in the  
22 nonwoven portion of the laminate such that the film is exposed through the nonwoven  
23 portions.
- 24 6. The method of claim 5 wherein:  
25 the first thermoplastic material is more hydrophilic than the second thermoplastic  
26 material.
- 27 7. An absorbent article using the materials of the above claims as a topsheet.
- 28 8. An absorbent article using the materials of the above claims as an intermediate layer.
- 29 9. An absorbent article having a body facing side and a garment facing side opposite the  
30 body facing side, the body facing side having a topsheet comprising:

31 a formed film layer; and  
32 a nonwoven layer on the body facing side of the formed film and having disturbances that  
33 allow a plurality of portions of the formed film to be exposed to the body facing side of  
34 the article.

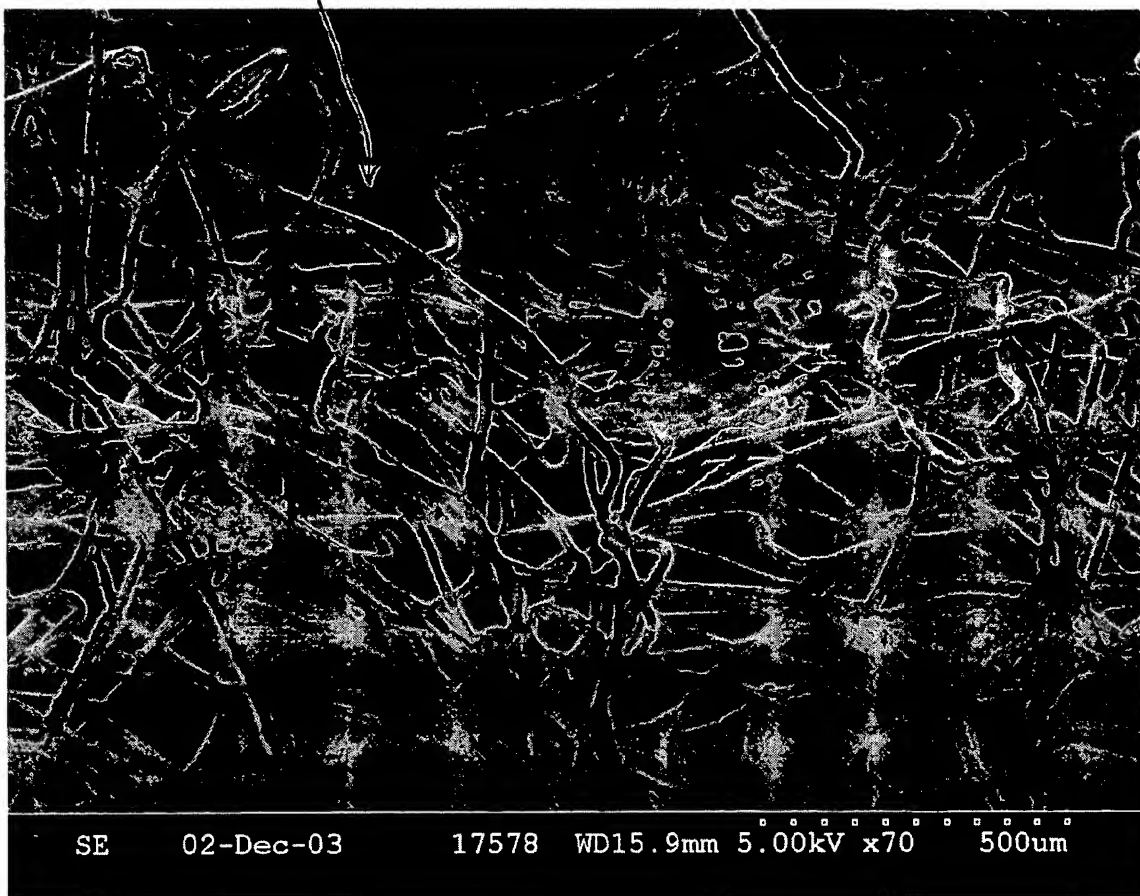
FIGURE 1

5

22

20

10



ST AVAILABLE COPY

FIGURE 2

